

CONNECTICUT AGRICULTURAL EXPERIMENT STATION.

Bulletin 24.—April 25, 1879.

FERTILIZER ANALYSES.

251. Ammoniated Superphosphate.

Made and sold by the New Haven Chemical Co., New Haven, Ct. Sampled April 4, by J. J. Webb. Guarantee: Phosphoric Acid 6-7 per cent., Ammonia $3\frac{1}{2}$ - $4\frac{1}{2}$ per cent., Potash 5-7 per cent., contains also Sulphuric Acid, lime, magnesia, etc.

256. Upton's Superphosphate of Lime

Made by George Upton, Boston, Mass., sold by C. B. Farley, assignee, Boston, sampled and sent April 14, by Geo. Maxwell, Rockville, Ct. Weight claimed per barrel, 230 pounds, actual weight of two barrels, 459 pounds.

252. Chicago Bone Dust.

Manufactured by Thompson & Edwards, Chicago, Ill., sold by John S. Welles, Hebron, Ct. Weight claimed per bag 200 pounds, actual weight of one bag 205 pounds. Very dry and fine, 73 per cent. passing holes of $\frac{1}{8}$ inch, but 4 per cent. coarser than $\frac{1}{2}$ inch.

STATION ANALYSIS.

	251	256	252
Nitrogen....	2.59	3.08	1.77
Phos. Acid soluble....	4.57	5.49	
Phos. Acid reverted....	1.70	4.58	26.03
Phos. Acid insoluble....	3.77	1.13	
Estima'd val. p. ton.	\$36.70	\$35.87	\$41.45
Cost p. ton.	33.00	30.00	30.00

The question is often asked, what are the other ingredients of a superphosphate besides those upon which its valuation is based?

This question is answered by the nearly complete analysis which follows:

251 AMMONIATED SUPERPHOSPHATE.

	Per cent.
Water.....	8.05
Organic (animal) matter by reference.....	30.23
Phosphoric Acid soluble.....	4.57
Phosphoric Acid reverted.....	1.70
Phosphoric Acid insoluble.....	3.77
Sulphuric Acid.....	14.12
Chlorine.....	7.50
Potash.....	7.31
Lime.....	14.82
Magnesia.....	1.37
Soda, oxide of iron and alumina.....	1.28
Sand and insoluble earth matters.....	5.28

100.00

Nitrogen in organic matters.....	2.59
Ammonia equivalent to nitrogen.....	3.14

As to the state of the ingredients, the acids are united to the bases, lime, potash, magnesia soda and oxide of iron, so far as the latter suffice, but the soluble phosphoric acid exists as an acid-salt, or, perhaps, to some extent, as free phosphoric acid. The sulphuric acid is present mainly as sulphate of lime (gypsum), the potash merely as muriate (potassium chloride). The reverted and insoluble phosphoric acid exist as phosphates of lime, magnesia and iron.

It is seen that a superphosphate like this contains all those elements of plant food which are derived by vegetation from the soil, and in that sense is a "complete fertilizer."

The question might be asked, do not the lime, magnesia, sulphuric acid, etc., present in this fertilizer add to its fertilizing power and influence its agricultural value? The answer must be, yes! It then may be asked—should not the substances, which are unnamed in the usual analyses, but which are admitted to have an agricultural value, be recognized in computing the commercial value?

The answer is—the three elements which serve as the basis of the valuation, viz.: nitrogen, phosphoric acid and potash, cannot be had separate from organic matters, sulphuric acid, lime, etc., and therefore the commercial value of the latter is included in that of the former. It is true that in different fertilizers, nitrogen phosphoric acid and potash are associated with different quantities, and to some extent with different kinds of other elements, but the latter are of very subordinate commercial value, and their variations do not sensibly affect the valuation of the fertilizer.

Another question often put is—why must the farmer buy so many pounds of water, organic matter, sand or even of sulphate of lime, in order to get the few pounds of valuable fertilizing matter? The answer is that the raw materials from which the manufacturer must obtain nitrogen, phosphoric acid and potash, in most cases, cannot be made to yield those valuable elements in a more concentrated state, without increased cost to the purchaser.

S. W. JOHNSON.

Director.

